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09/781,857	02/12/2001	Turan Erdogan	12-42-7	5151

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EXAMINER

CHAN, ALEX H

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 11/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/781,857

Applicant(s)

ERDOGAN ET AL.

Examiner

Alex H Chan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 9, 10, 15 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: “361-364 (page 6, line 4 of specification),” “76 (page 9, line 6),” “76, 78 and 80 (page 10, line 8).” A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Specification*

2. The disclosure is objected to because of the following informalities:
- a. Reference sign “74” is noted as “one arm (page 9, line 5)” whereas “74” is also referred to as “WDM DeMUX” in Fig. 11-13.
  - b. There is a typographical error on page 8, line 12 (an input signal “I”).
- Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 6 and 7** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In particular, applicant fails to disclose, both in the specification and drawings, how the in-line polarimeter determines the

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relative fraction of light incident on the detector with respect to the test RF signal. Also, in regards to claim 7, applicant fails to disclose how the test RF signal is being impressed or encoded onto polarizations with the plurality of optical signals which would enable one of ordinary skill in the art to make or use the invention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. **Claims 8, 11, 13 and 18** are rejected under 35 U.S.C. 102(e) as being anticipated over U.S. Patent No. 6,567,167 B1 to Chou et al (hereinafter Chou).

**Regarding claim 11**, Chou discloses an optical transmission system comprising a transmitter (15 of Fig. 1) for providing one or more optical input signals (Col. 5, lines 16-24), an optical transmission path (22 of Fig. 22) and an optical receiver (240 of Fig. 10), said optical transmission system further comprising at least one active polarization control arrangement (e.g. combination of 100 and 200 of Fig. 1), each active polarization control arrangement including a polarization control element (e.g. 100 or 108 or 170 or 200 of Fig. 1) responsive to one or more input optical signals propagating along the optical transmission path (e.g. 100 collimates optical signals from output 21 of Fig. 1 and Col. 3, 36-57, or 200 separates the two states of polarization from 10, Col. 4, lines 30-42), the polarization control element for producing as an output an optical signal exhibiting a predetermined state of polarization (Col. 3, lines 44-52); an in-line

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polarimeter (110 or 210 of Fig. 1) integral with the optical transmission path configured to out-couple signals determined by the state of polarization of the input optical signal (Col. 4, lines 14-30); and a feedback control element (120 or 220 of Fig. 1) disposed in a signal path between the in-line polarimeter (210 of Fig. 1) control signal output (215 of Fig. 1) and an adjustable input (e.g. via 130 of Fig. 1) to the polarization control element (170 of Fig. 1), said feedback control element for providing correction signal inputs to the polarization control element based on the control signal outputs from the in-line polarimeter (Col. 8, lines 31-65).

**Regarding claim 13**, Chou discloses a polarization beam splitter (165 and 202 of Fig. 1 or 114, 116, 117, 119 of Fig. 2 or 171 and 172 of Fig. 3), disposed at the output of the in-line polarimeter (110 and 210 of Fig. 1), the polarization control element utilized to adjust the output signal state of polarization (e.g. by measuring the difference between optical signals having different polarization components or PSPs) to align with one of the beamsplitter principal axes (Col. 5, lines 55-Col. 6, lines 11 and Col. 8, lines 31-42).

**Regarding claim 18**, Chou discloses the least one active polarization control arrangement (e.g. combination of 100 and 200 of Fig. 1) comprises an in-line polarimeter (210 of Fig. 1) located at the optical receiver (240 of Fig. 1) and the polarization controller (108 of Fig. 1) located at the optical transmitter (15 of Fig. 1), using a telemetry channel (132 or 134 of Fig. 1) to transmit feedback information (e.g. via 122 and 120 of Fig. 1) from the in-line polarimeter to the polarization controller (Col. 3, lines 36-57).

**Regarding claim 8**, the limitations introduced by claim 8 correspond to the limitations introduced by claim 11. The treatment of claim 11 above reads on the corresponding limitations of claim 8.

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***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou in view of U. S. Patent No. 6,385,356 B1 to Jopson et al (hereinafter Jopson).

**Regarding claim 12**, Chou discloses an optical transmission path (22 of Fig. 1) comprises the active polarization control arrangement (e.g. combination of 10 and 200 of Fig. 1) is used to orient the polarization axes (e.g. x and y optical axes) of the optical output from the in-line polarimeter (Col. 5, lines 39-54). He does not disclose at least a section of birefringent fiber and the active polarization control arrangement is used with the optical axes of the birefringent transmission path fiber. Jopson discloses at least a section of birefringent fiber (1010 of Fig. 10 and Col. 7, lines 54-59) and the active polarization control arrangement (1020 of Fig. 10) is used with the optical axes of the birefringent transmission path fiber (Col. 7, lines 3-16, lines 64-67 and Col. 8, lines 1-5). Accordingly, one of the ordinary would have been motivated to incorporate a section of birefringent fibers and the active polarization control arrangement is used with the optical axes of the birefringent transmission path fiber in order to impart an uniformly oriented PMD to the light beam traveling through the fibers (Col. 2, lines 18-29). Therefore, it would have been obvious to one of artisan skilled in the pertinent art at the time the invention was made to have modified the fiber optic transmission system of Chou by incorporating a section of the birefringent fibers for orienting the optical axes of the birefringent

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transmission path fiber because Jopson suggests that this allows PMD uniformity to the light beam traveling through the fibers.

9. **Claims 1-5, 14 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou in view of U. S. Patent No. 6,208,442 B1 to Liu et al (hereinafter Liu).

**Regarding claim 14**, Chou discloses an active polarization control arrangement having polarization beam splitters (165 and 202 of Fig. 1 or 114, 116, 117, 119 of Fig. 2 or 171 and 172 of Fig. 3) but does not disclose that the arrangement further comprises wavelength filters disposed at each output of the polarization beam splitter to discriminate between two orthogonal channels with closely spaced wavelengths. Liu discloses wavelength filters (e.g. 742 and 744 of Fig. 7) disposed at each output of the polarization beam splitter (724a and 724b or 747 of Fig. 7 and Col. 5, lines 42-65) to discriminate between two orthogonal channels with closely spaced wavelengths (Col. 5, lines 40-42, lines 15-32 and Col. 3, lines 58-65). Accordingly, one of the ordinary skill in the art would have been motivated to incorporate wavelength filters in order to provide different polarization to contiguous channels (Col. 2, lines 24-30). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the fiber optic transmission system of Chou by placing wavelength filters disposed at each output of the polarization beam splitters because Liu suggests that this allows a plurality of channels to have a first and second polarization.

**Regarding claim 17**, Chou in view of Liu discloses at least one active polarization control arrangement comprises a first arrangement (10 of Fig. 1, Chou) disposed at an optical transmitter (15 of Fig. 1, Chou) and a second arrangement (200 of Fig. 1, Chou) disposed at an optical receiver (240 of Fig. 1, Chou).

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**Regarding claim 1**, Chou in view of Liu discloses a WDM optical communication system (Col. 1, lines 19-21, Liu) including an arrangement for assessing the polarization (100 or 200 of Fig. 1, Chou) of each optical signal (Col. 3, lines 39-41, Chou) within a plurality of wavelength division multiplexed signals (Col. 1, lines 21-24, Liu) propagating along a transmission path (22 of Fig. 1, Chou), the arrangement comprising at least one in-line polarimeter (110 or 210 of Fig. 1, Chou) disposed along and integral with said transmission path, said at least one in-line polarimeter configured to out-couple predetermined portions of each optical signal (Col. 4, lines 14-30, Chou) passing therethrough to collect information (e.g. via 120 of Fig. 1, Chou) with respect to the state of polarization (i.e. PSPs) for each optical signal (Col. 3, lines 48-53, Chou); and a network control element (108 of Fig. 1, Chou), responsive to the output from said at least one in-line polarimeter (110 of Fig. 1, Chou), for either one of modifying and controlling the polarization of one or more of said optical signals in response to the state of polarization information (Col. 3, lines 53-57, Chou).

**Regarding claim 2**, Chou in view of Liu discloses a plurality of in-line polarimeters (110 and 210 of Fig. 1, Chou) (e.g. state of polarization (SOP) can be determined and defined in terms of Formula 1 (Col. 4, lines 43-Col. 5, lines 15, Chou) and thus also make it a complete or partial polarimeter).

**Regarding claims 3-5**, the limitations introduced by claims 3-5 correspond to the limitations introduced by claim 2. The treatment of claim 2 above reads on the corresponding limitations of claims 3-5.



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10. **Claims 6-7 (as far as understood)** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chou in view of Liu as applied to claim 1 above, and further in view of U. S. Patent No. 6,134,036 to Andreozzi et al (hereinafter Andreozzi).

**Regarding claim 6**, Chou in view of Liu teaches that the polarimeter (110 of Fig. 2, Chou) determines the relative fraction of light (e.g. by measuring the power of first optical signal or the difference between optical signals having polarization components oriented in the x and y direction, Col. 5, line 55-Col. 6, line 11) incident on a particular detector (e.g. 114a, 116a, 117a, or 119a of Fig. 2). He fails to teach an RF generator for impressing a test RF signal onto one or more preselected wavelengths within the plurality of wavelengths. Andreozzi discloses an RF generator (e.g. RF synthesizers, 416 of Fig. 4 and Col. 10, lines 14-20) for impressing a test RF signal (e.g. RF<sub>1</sub>, RF<sub>2</sub>, RF<sub>3</sub>, and RF<sub>4</sub> of Fig. 4 and Col. 6, lines 18-27 and Col. 7, lines 10-22) onto one or more preselected wavelengths ( $\lambda_1$ ,  $\lambda_2$ ,  $\lambda_3$ , and  $\lambda_4$  of Fig. 4) within the plurality of wavelengths (228 of Fig. 3) and determining the relative fraction of light incident with respect to the test RF signal (e.g. by detecting channel power level of each wavelength, Col. 5, lines 60-65, Col. 6, lines 65-Col. 7, line 9 and Col. 7, lines 59-65). Accordingly, one of the ordinary skill in the art would have been motivated to incorporate an RF synthesizers in order to effect cross-coupling which alleviates the problem of polarization mode dispersion (Col. 7 lines 15-42). Therefore, it would have been obvious to one of artisan skill in the art to have modified the fiber optic transmission system of Chou by incorporating a RF tone generator for impressing a test RF signal because Andreozzi suggests that this would effect cross-coupling, which alleviates polarization mode dispersion.

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**Regarding claim 7**, Chou in view of Liu and Andreozzi discloses all limitations as disclosed in claim 7, further discloses an RF tone generator (e.g. RF synthesizers, 416 of Fig. 4 and Col. 10, lines 14-20, Andreozzi) for impressing a test RF signal (e.g. RF<sub>1</sub>, RF<sub>2</sub>, RF<sub>3</sub>, and RF<sub>4</sub> of Fig. 4 and Col. 6, lines 18-27 and Col. 7, lines 10-22, Andreozzi) onto one or more preselected polarizations (e.g. by obtaining the polarization rotation of particular combination of wavelengths, Col. 7, lines 25-33, Andreozzi or via x and y oriented polarization components of Stoke's parameter, Col. 5, lines 55-Col. 6, lines 56, Chou).

***Allowable Subject Matter***

11. **Claims 9, 10, 15 and 16** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Gordon et al is cited to show polarization controller and polarization states having transmitter and receiver and feedback control element (Fig. 2). Heffner is cited to show polarimeter and polarization controller (Fig. 5). Ono is cited to show a polarization controlling device and feedback element (Fig. 1).

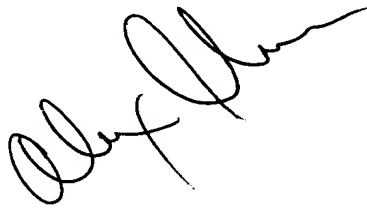
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Alex Chan  
Patent Examiner  
October 28, 2003



JASON CHAN  
SUPERVISORY PATENT EXAMINER  
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